

(12) UK Patent Application (19) GB (11) 2 080 174 A

(21) Application No 8119438

(22) Date of filing
24 Jun 1981

(30) Priority data

(31) 80/23185

(32) 16 Jul 1980

(33) United Kingdom (GB)

(43) Application published
3 Feb 1982

(51) INT CL³ B23B 29/26

(52) Domestic classification
B3T 4B31C3 4B31C4

(56) Documents cited
None

(58) Field of search
B3T

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(54) Tool holder for row of tools

(57) A machine tool holder for use with a capstan lathe has a shank 10 and pair of parallel arms 17, 18 extending axially from the shank. Each arm has a slot which can receive several cutting tools 28. The tools are clamped in position by screws 30 and the arms and slots are so disposed that the cutting edges of the tools lie on a plane through the axis of the holder. An insert block can be placed in the slot held by a clamping screw. The block has a threaded bore accepting an adjusting screw which abuts the rear of an adjacent tool to adjust it radially. The holder carries a centre drill 14.

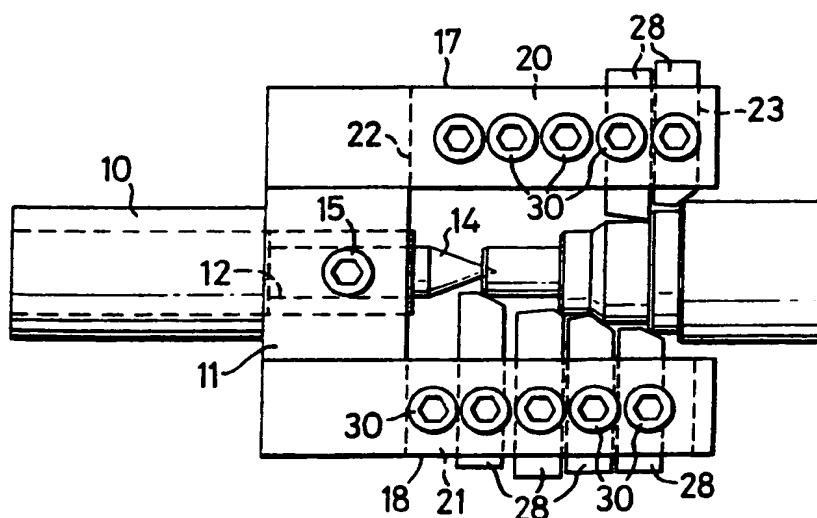


FIG.1

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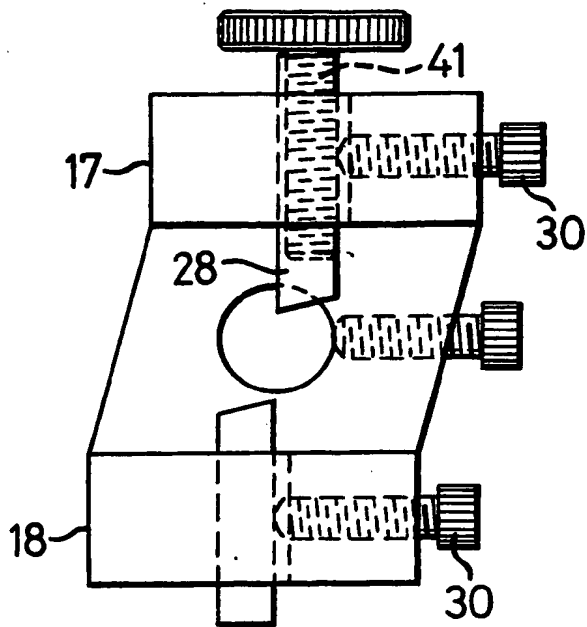


FIG. 3a

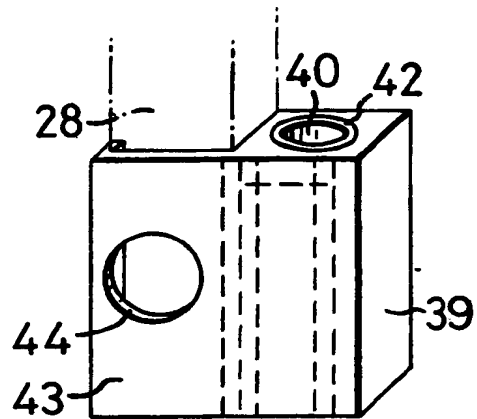


FIG. 3b

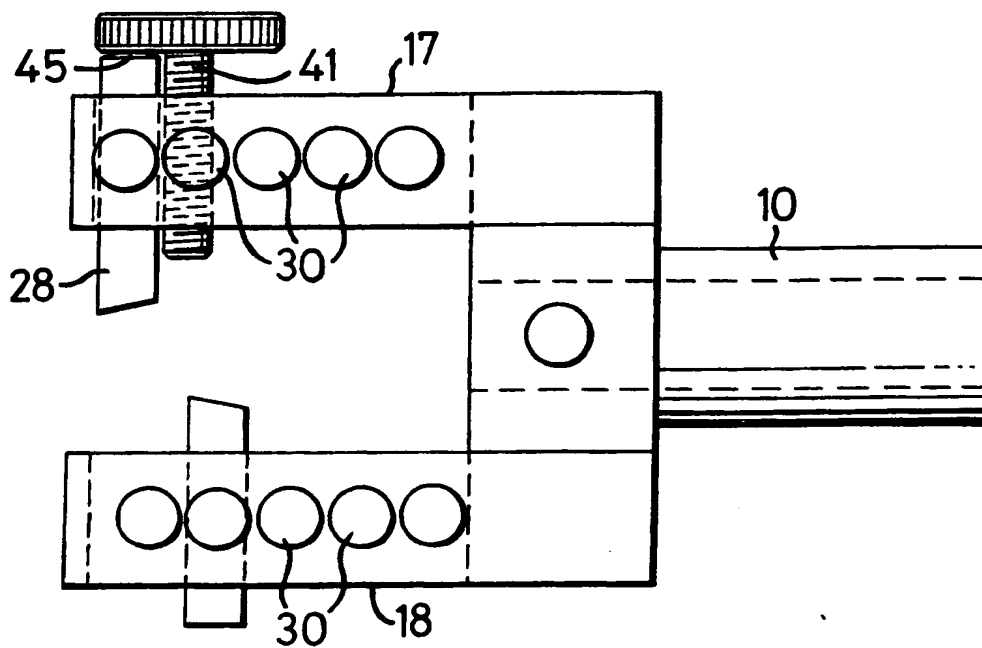


FIG. 3c

SPECIFICATION

Improvements in or relating to machine tools

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This invention relates to machine tools. The invention particularly relates to a tool holder for use with a capstan lathe.

In general a capstan lathe has a turret with a number of stations, typically six. Each station is arranged to receive a machine tool holder which can usually hold a single tool. The turret is rotatable in six steps so that the tools can be moved successively to a position for carrying out various machining operations on a workpiece. Typical machining operations are centre drilling, drilling, tapping, turning and forming an external thread with a die box. It will be apparent that it is often possible to employ most or all stations for such operations leaving insufficient stations for operations such as chamfering and turning other diameters.

I have designed a tool holder which is intended to alleviate this problem. The tool holder of the present invention allows several tools to be mounted at one turret station so that a plurality of chamfering or turning operations can be carried out at that station.

According to the present invention there is provided a machine tool holder comprising a shank for location in a machine turret and at least one arm extending generally parallel to but spaced from the shank axis, said arm defining a surface against which a plurality of tools can be clamped by clamping means so that each tool projects from said arm towards the axis of the holder, said surface being so disposed that the cutting edge of the clamped tools lie on a centre line through the axis of the holder.

The tool holder may have a pair of spaced generally parallel arms each arm defining a surface against which a plurality of tools can be clamped by clamping means so that each tool projects from its arm towards the axis of the holder, each surface being so disposed that the cutting edge of the tools lie on a centre line through the axis of the holder. Preferably each arm has a slot formed therein, one side wall of said slot constituting said surface and the arms are offset laterally a predetermined distance.

The tool clamping means may comprise screws. Preferably all said clamping screws are located on the same side of the holder relative to a plane containing said centre line. The clamping screws on one arm may be staggered axially of the holder relative to the clamping screws on the other arm.

The tool holder may include means allowing adjustment of the position of a tool diametrically relative to a workpiece.

The invention will be described now by way of example only with particular reference to

the accompanying drawings. In the drawings:

Figure 1 is a plan view of a tool holder in accordance with the present invention;

Figure 2 is an end view of the tool holder, 70 and

Figures 3a to 3c illustrate a modification of the tool holder.

Referring to the drawing a tool holder for use on a capstan lathe includes a tubular, 75 cylindrical shank 10 which can be located in one station of a turret of the lathe. The shank 10 is rigidly connected to a block 11. The block 11 is generally rectangular in plan (see Fig. 1) and generally rhomboidal in end elevation (see Fig. 2). The block 11 has a bore 12 80 formed therein, the axis of the bore 12 being substantially coaxial with the axis of the shank 10. The bore 12 can receive a centre drill 14. The drill 14 is clamped in the bore 12 by 85 means of a clamping screw 15 which is screwed into a tapped hole in the block 11.

A pair of arms 17, 18 are rigidly connected one to each side face of the block 11. Each arm is generally rectangular and projects axially from the block 11 away from the shank 10. Each arm has a slot 20, 21 formed therein, each slot having a generally rectangular cross-section and extending through the thickness of its arm (Fig. 2). The dimensions 95 of each slot are illustrated by the dotted lines 22, 23, 24 and 25 of Figs. 1 and 2. Each slot 20, 21 can receive a plurality of cutting tools 28 which can be clamped against one side wall of a slot by means of clamping 100 screws 30 which are located in tapped bores in the arms 17 and 18.

It will be seen from Fig. 2 that the arms 17 and 18 and hence the slots 20, 21 are offset laterally. The offset is such that the cutting 105 edge of each tool clamped to the arm 17 lies on a centre line 32 which also passes through the cutting edge of a corresponding tool clamped to the arm 18. As a result of this design it is not necessary to adjust the tool 110 height and it is a relatively simple matter to position the tools 28 in the holder. It will be apparent to a person skilled in the art that the tools 28 can be set to the positions shown in Fig. 1 in a simple manner so that a plurality 115 of turning and chamfering operations can be carried out simultaneously on a workpiece 33. A further feature which simplifies setting up the holder is the location of all clamping screws on one side of the holder. Additionally 120 it will be seen from Fig. 1 that the clamping screws on the arm 17 are offset axially of the holder relative to the clamping screws on the arm 18. This arrangement facilitates location of a tool at any desired position relative to a 125 workpiece.

Thus it will be seen that the present holder, which is mounted at one station of a turret of capstan lathe, permits several machining operations to be carried out at that one station.

130 A refinement of the arrangement described

above is shown in Figs. 3a to 3c. This is a fine adjustment device which comprises a generally rectangular block 39 which is formed with a longitudinal through slot for receiving a cutting tool 28 and a tapped through bore 40 for receiving an adjusting screw 41. The cross sectional shape of the slot corresponds to that of a cutting tool. The mouth of the bore 40 is provided with a nylon ring 42. The face 43 of the block is formed with a circular aperture 44 the axis of which intersects the axis of the tool slot substantially at right angles.

The insert is designed for location in one of the slots 20, 21 in the arms 17, 18 as illustrated in Figs. 3a and 3c. The insert occupies the space of two cutting tools and is clamped in position by one of the tool clamping screws 30. The tool within the insert 39 is clamped by the adjacent clamping screw 30 which extends through the aperture 44. The diameter of the aperture 44 is greater than the diameter of the clamping screw to allow for some longitudinal adjustment.

When the insert is in position in the tool holder, adjustment of the diametrical position of the tool in the insert relative to a workpiece can be effected by means of the adjusting screw 41. As can be seen in Fig. 3c the head of adjusting screw contacts the end of the tool in the insert so that rotation of screw 41 results in movement of the tool diametrically relative to a workpiece. Preferably the end face 45 of the tool is domed (see Fig. 3c) to prevent it from scoring the underside of the head of the screw 41. The nylon ring 42 provides a certain degree of friction which allows the screw 41 to be turned by hand but not to become loose due to vibration from movement of the turret.

The fine adjustment device shown in Figures 3a to 3c can be used in any position on either arm of the tool holder and more than one such device can be used. In addition to providing a fine adjustment facility it also gives a cutting tool extra support particularly when relatively heavy cutting operations are being carried out.

50 CLAIMS

1. A machine tool holder comprising a shank for location in a machine turret and at least one arm extending generally parallel to but spaced from the shank axis, said arm defining a surface against which a plurality of tools can be clamped by clamping means so that each tool projects from said arm towards the axis of the holder, said surface being so disposed that the cutting edge of the clamped tools lie on a centre line through the axis of the holder.

2. A machine tool holder as claimed in claim 1 and comprising a pair of spaced generally parallel arms, said surface of each arm being so disposed that the cutting edge

of the clamped tools lie on a centre line through the axis of the holder.

3. A machine tool holder as claimed in claim 2 wherein each arm has a slot formed therein, one side wall of each said slot constituting said surface and the arms being offset laterally a predetermined distance.

4. A machine tool holder as claimed in claim 3 wherein said clamping means comprise screws.

5. A machine tool holder as claimed in claim 4 wherein all said clamping screws are located on the same side of the holder relative to a plane containing said centre line.

6. A machine tool holder as claimed in claim 5 wherein the clamping screws on one arm of said holder are staggered axially of the holder relative to the clamping screws on the other arm.

7. A machine tool holder as claimed in any preceding claim including means allowing adjustment of the position of a tool diametrically relative to a workpiece.

8. A machine tool holder substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

Printed for Her Majesty's Stationery Office
by Burgess & Son (Abingdon) Ltd.—1982.
Published at The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.